

REMARKS

Applicant respectfully acknowledges the allowance of claims 41-43. Claims 32, 34, 37 and 46 have been amended. Claims 26, 27 and 32-47 are pending. Applicant reserves the right to pursue the original and other claims in this and in other applications.

Claim 32 stands rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Applicant respectfully traverses the rejection. Claim 32 has been amended to overcome the rejection.

Claims 27, 32-33, 39-40 and 44-45 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,259,083 ("Kimura"). Applicant respectfully traverses the rejection.

Claim 27 recites an active pixel sensor system comprising, "a lensing element configured to receive optical data and change an imaging characteristic, said lensing element providing cover for the active pixel array; and a mounting structure extending from a plate surface, said mounting structure being adapted to removably connect a prefabricated lens system to said plate above said lensing element."

Kimura is directed to a solid state imaging device having a concave lens structure. Kimura discloses a sensor 2 formed on a substrate 1 and a transfer electrode 4 that is formed through a gate insulating film 3 on the substrate 1 except for the sensor 2; on the transfer electrode 4 is a light shielding film 6 through an inter-layer insulating film 7. (Kimura, col. 3, lines 13-20) A well-shaped dug structure 21 is formed in the inter-layer insulating film 7; a high refractive index layer 8 is formed over the inter-layer insulating film 7, a color filter 10 is formed over over a passivation film 9 and a microlens 11 is

formed on the color filter 10. (Kimura, col. 3, lines 29-53) The width of the well structure 21 is set to be smaller than an opening width w of the light shielding film 6 above the light receiving portion 2. (Kimura, col. 3, line 66 to col. 4, line 2) The Office Action contends that the color filter 10 is the mounting structure and the high refractive index layer 8 is the cover plate. (Office Action, pp. 3-4) The color filter 10, however, is not a mounting structure extending from a plate surface. Instead, the color filter 10 is formed over a passivation film 9, which is formed over a high refractive index layer 8. That is, Kimura fails to disclose or suggest "a mounting structure extending from a plate surface, said mounting structure being adapted to removably connect a prefabricated lens system to said plate above said lensing element." For at least these reasons, Applicant respectfully submits that the rejection of claim 27 be withdrawn and the claim allowed.

Claim 32 recites an assembly for an image sensor device comprising, in part, "a cover plate operatively disposed over said image sensor array, said cover plate including an integrated lensing structure which is developed to change imaging characteristics of incoming radiation which impinge towards said image sensor array; and a mounting structure formed as a protrusion on a surface of said cover plate."

As mentioned earlier, the color filter 10 in the Kimura device is not a mounting structure extending from a surface of a cover plate, much less a protrusion. Particularly, Kimura fails to disclose or suggest "a cover plate operatively disposed over said image sensor array, said cover plate including an integrated lensing structure which is developed to change imaging characteristics of incoming radiation which impinge towards said image sensor array; and a mounting structure formed as a protrusion on a surface of said cover plate." Therefore, Applicant respectfully submits that the rejection of claim 32 and its dependent claim 33 be withdrawn and the claims allowed.

Claim 39 depends from claim 32 and further recites “wherein said integrated lensing structure forms a concave lens part.”

The Office Action contends that Kimura discloses this limitation. (Office Action, p.4) Applicant respectfully disagrees. The cited feature 21 in Kimura is a well structure whose aspect ratio is set as large as possible (Kimura, col. 3, lines 55-65), and not a concave lens part. For this additional reason, Applicant respectfully submits that the rejection of claim 39 be withdrawn and the claim allowed.

Claim 40 depends from claim 32 and further recites “wherein said integrated lensing structure forms a convex lens part.”

The Office Action contends that Kimura discloses this limitation. (Office Action, p.4) Applicant respectfully disagrees. The cited feature 21 in Kimura is a well structure whose aspect ratio is set as large as possible (Kimura, col. 3, lines 55-65), and not a convex lens part. For this additional reason, Applicant respectfully submits that the rejection of claim 40 be withdrawn and the claim allowed.

Claim 44 recites a method for controlling Petzval field curvature in a camera system comprising, in part, “contouring a cover plate to form a lensing structure; securing a mounting structure to an upper surface of said cover plate, said mounting structure being adapted to connect a lens system to said cover plate above said lensing structure; and covering an imaging array with said cover plate.”

As mentioned earlier, the color filter 10 in the Kimura device is not a mounting structure extending from an upper surface of a cover plate. Further, the dug structure 21 is formed in an inter-layer insulating film 7 (Kimura, co. 3, lines 29-30) and not in the high

refractive index layer 8, as indicated in the Office Action, (Office Action, p. 5). Thus, Kimura fails to disclose or suggest "contouring a cover plate to form a lensing structure; securing a mounting structure to an upper surface of said cover plate, said mounting structure being adapted to connect a lens system to said cover plate above said lensing structure; and covering an imaging array with said cover plate." For these reasons, the rejection of claim 44 and its dependent claim 45 should be withdrawn and the claims allowed.

Claim 45 depends from claim 44 and further recites that "said lensing element is formed to include at least one of a refractive lens and a diffractive lens."

The Office Action contends that Kimura discloses these additional limitations of claim 45. (Office Action, p.5) Applicant respectfully disagrees. The cited portions of Kimura only disclose that the peripheral portion of the well-shaped dug structure 21 becomes a concave lens structure and light is refracted or totally reflected by the interface between two layers 7 and 8. Particularly, Kimura fails to disclose or suggest "[a] lensing element [] formed to include at least one of a refractive lens and a diffractive lens." For these additional reasons, Applicant respectfully submits that rejection of claim 45 be withdrawn and the claim allowed.

Claims 26 and 46-47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kimura in view of U.S. Patent No. 5,847,756 ("Iura"). Applicant respectfully traverses the rejection.

Claim 26 recites an image sensor camera system comprising, in part, "a lens system operatively coupled to the image sensor array and configured to carry and focus

the optical data onto the image sensor array, said lens system including a plurality of lenses and a cover plate, said cover plate contoured into a lensing structure that changes an imaging characteristic; a mounting structure extending from an upper surface of said cover plate and adapted to secure said lens system to said cover plate above said lensing structure; and sensor electronics coupled to the image sensor array.”

As mentioned above, Kimura fails to disclose or suggest “a mounting structure extending from an upper surface of said cover plate and adapted to secure said lens system to said cover plate above said lensing structure.” Iura does not cure the deficiencies of Kimura. Iura is directed to an image pickup apparatus having a lens system 101, a shutter 102, an image sensor device 103, an amplifier 104, an analog-to-digital converter 105, a signal processing circuit 106, a camera system control circuit 107, an image sensor driving circuit 109 and a shutter button 110. (Iura, col. 7, lines 38-43) The Office Action relies on Iura as only disclosing an image sensor camera system with an imager and sensor electronics including an amplifier. (Office Action, p.7) Because Kimura and Iura, individually or in combination, fail to disclose or suggest all of the limitations of claim 26, Applicant respectfully submits that the rejection of claim 26 should be withdrawn and the claim allowed.

Claim 46 recites a method of forming a digital image comprising, in part, “focusing incident light on an imaging array by passing the light through a lensing element formed in a cover plate, said cover plate being secured to a prefabricated lens system by a mounting structure formed as a protrusion on a surface of said cover plate.”

As mentioned earlier, the Kimura and Iura combination fails to disclose or suggest a mounting structure formed as a protrusion on a surface of a cover part.

Particularly, the Kimura and Iura combination fails to disclose or suggest “[a] cover plate being secured to a prefabricated lens system by a mounting structure formed as a protrusion on a surface of said cover plate.” For at least these reasons, Applicant respectfully submits that the rejection of claim 46 and its dependent claim 47 be withdrawn and the claims allowed.

Claim 47 further recites that “said lensing element is formed to include at least one of a refractive lens and a diffractive lens.”

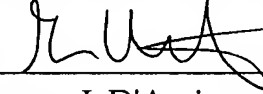
The Office Action contends that Kimura discloses these additional limitations of claim 47. (Office Action, p.7) Applicant respectfully disagrees. The cited portions of Kimura only disclose that the peripheral portion of the well-shaped dug structure 21 becomes a concave lens structure and light is refracted or totally reflected by the interface between two layers 7 and 8. Particularly, Kimura fails to disclose or suggest “[a] lensing element [] formed to include at least one of a refractive lens and a diffractive lens.” For these additional reasons, Applicant respectfully submits that rejection of claim 47 be withdrawn and the claim allowed.

Claims 34-38 stand objected to as being dependent upon a rejected base claim. The Examiner indicates that these claims would be allowable if rewritten in independent form to include all of the limitations of their respective base claim. Pursuant to the Examiner’s suggestion, claims 34 and 37 have been amended to include all of the limitations of claims 32 and 33. Accordingly, claims 34-38 are allowable.

In view of the above, Applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

By  #41,198

Thomas J. D'Amico

Registration No.: 28,371

Ranga Sourirajan

Registration No.: 60,109

DICKSTEIN SHAPIRO LLP

1825 Eye Street, NW

Washington, DC 20006-5403

(202) 420-2200

Attorneys for Applicant